

APPENDIX B

Field Sampling Plan

Prepared for

Settling Work Defendants

**FIELD SAMPLING PLAN FOR THE WORK
AREA MONITORING PLAN
OMEGA SUPERFUND SITE
OPERABLE UNIT 2**

Prepared by

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Project Number: WR2209

18 November 2016

Field Sampling Plan for the Work Area

Monitoring Plan

Omega Superfund Site

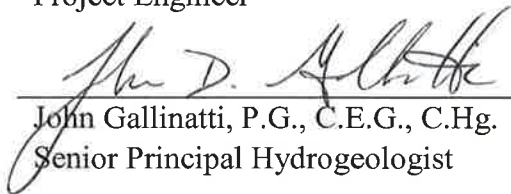
Operable Unit 2

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ACRONYMS AND ABBREVIATIONS

2016 CD	Consent Decree lodged April 20, 2016 covering Operable Unit 2 at the Omega Chemical Corporation Superfund Site
COCs	Chemicals of Concern
DO	dissolved oxygen
DTSC	California Department of Toxic Substance Control
EC	electrical conductivity
EPA	United States Environmental Protection Agency
FSP	Field Sampling Plan
Geosyntec	Geosyntec Consultants, Inc.
HASP	Health and Safety Plan
IDW	investigation-derived waste
ml	milliliter
ml/min	milliliters per minute
ORP	oxidation-reduction potential
OSHA	Occupational Safety and Health Administration
OU2	Operable Unit 2, the contamination in groundwater generally downgradient of Omega Property, much of which has commingled with chemicals released at other locations into a regional plume containing multiple contaminants which, when considered in total, is more than four miles long and one mile wide. The OU2 boundary is depicted in the 2016 CD, Appendix C.
QAPP	Quality Assurance Project Plan
SOW	Statement of Work, Appendix B to the 2016 CD.
SWDs	Settling Work Defendants, as identified in Appendix E to the 2016 CD. SWDs include the McKesson Corporation and OPOG (Omega Chemical Corporation Superfund Site Potentially Responsible Party Organized Group).

QA	quality assurance
QC	quality control
USA	Underground Service Alert
VOCs	Volatile organic compounds
WAMP	Work Area Monitoring Plan

1. INTRODUCTION

This Field Sampling Plan (FSP) was prepared by Geosyntec Consultants, Inc. (Geosyntec) on behalf of the Settling Work Defendants (SWDs) for the Omega Chemical Corporation Superfund Site, Operable Unit 2 (OU2), shown in Figure B-1. This FSP was prepared in accordance with Section 7.7c of the Statement of Work (SOW), Appendix B of the Consent Decree (2016 CD) for OU2 at the Omega Chemical Corporation Superfund Site (United States Environmental Protection Agency (EPA), 2016). This FSP describes the procedures to be used for monitoring activities to be performed under the Work Area Monitoring Plan (WAMP).

2. PRE-FIELD ACTIVITIES

2.1 Permitting and Access

Prior to the start of WAMP activities, the SWDs will obtain the necessary property access agreements and encroachment permits, and will update the site-specific Health and Safety Plan (HASP) as needed. Traffic control plans will be developed as needed, and will include appropriate provisions for signage, lane closure, and egress.

2.2 Health and Safety

The HASP (Appendix C of the WAMP) has been prepared in accordance with local, state, and federal requirements to encompass the WAMP field activities. The objective of the HASP is to present safety protocols to ensure that all operations are conducted in a manner that protects worker safety and meets compliance with Occupational Safety and Health Administration (OSHA) regulations and EPA safety policies. Field activities will be performed by individuals with appropriate training (CFR 1910.120), in accordance with the HASP.

Contractors selected to conduct the WAMP fieldwork will prepare their own HASPs to encompass their individual field activities. Before field activities commence, the HASP will be reviewed and signed by the field personnel. The HASP will contain information pertaining to field conditions, potential hazards, hazard control, monitoring procedures, personal protective equipment, emergency procedures, and hospital location. The HASP will be available in the field for the field personnel during all WAMP field activities. Unless specified otherwise in the HASP, field personnel will generally work in modified Level D personal protective equipment.

A safety tailgate meeting will be conducted every day prior to the start of field activities.

3. WATER LEVEL MEASUREMENT

Water levels will be measured in the monitoring wells specified in Table B-1. Monitoring well locations are shown in Figure B-2. Resulting depth-to-water data will be recorded and used in conjunction with surveyed measuring point elevation data to construct water level contour maps for the hydrogeologic units of interest. These maps will be used to interpret groundwater flow conditions and to determine horizontal and vertical gradients in monitoring wells.

The objective of water level measurement is to provide data that are of sufficient quality to support decisions made during remedy design activities and that are representative of actual site conditions. The objectives of this task will be achieved by implementing QC procedures for water level measurement, by conforming to the approach specified in this FSP, and by conforming to specific QA objectives for water level measurement.

3.1 Equipment and/or Instrumentation

The QED® or Solinst® flat tape sounder is equipped with a plastic, laminated, two-wire cable with a weighted electrode attached to the end of the cable. The cable is graduated in markings every 0.01 foot. Alternate water level sounders can be used if they provide similar accuracy and precision as QED® or Solinst® flat tape sounders. The pressure transducer consists of a downhole probe constructed of stainless steel. Some transducers have a downhole communication cable and others are self-contained and hung from a stainless steel cable to secure the probe to the wellhead.

3.2 Preparation

Water level indicators, including QED® or Solinst® flat tape sounders, will be calibrated periodically by comparing a water level measured with the indicator against a water level measured with a steel tape or other water level indicator, and by checking the distances between the water level indicator markings with a steel tape (Form B-1).

The following procedures will be performed in preparation for monitoring water levels with sounders:

- Identify the wells to be measured.

- Identify the established measuring point for each well. The measuring point elevation will be determined by a licensed land surveyor. To the extent practical, each monitoring well should use the same measuring reference point at each well (e.g., north side of casing, top of sounding tube, etc.) for water level measurements.
- Review any previous water level measurements for each well.
- Decontaminate the water level indicator by using a nonphosphate detergent wash, followed by two tap water rinses and a distilled water rinse.

The following procedures will be performed in preparation for monitoring water levels with pressure transducers:

- Identify the wells to be equipped with pressure transducers. Identify required depth setting of transducer based on the expected range of water levels over the period during which the transducer will be installed in the well.
- Identify the type, appropriate pressure range, and model of pressure transducer to be equipped in monitoring wells and review the manufacturer's installation, set-up, and maintenance requirements.
- Identify and establish the measuring point for each well. The measuring point elevation will be determined by a licensed land surveyor.
- Identify and establish a pressure reading reference point for each well. Typically, the reference point is the depth to water at the time of pressure transducer installation.
- Determine time interval of measurement (e.g., on the hour, or on the quarter hour) and frequency of pressure readings. The time of measurement and frequency of pressure readings for wells equipped with pressure transducers should be equivalent across the Site.

3.3 Procedures

The following procedures will be used for measuring water levels with flat-tape sounders:

- Measure the depth to water from the measuring point elevation twice for each well. The variation between the two consecutive measurements must be no more than 0.02 foot.
- For the QED[®] or Solinst[®] flat tape sounder, identify the water level and read the measurement from the marking on the flat tape.
- During periodic monitoring events, record the depth to water, date, and time of measurement on the static water level data sheet (Form B-1). Examine previously measured water levels for the well. If the difference between the current water level measurement and the previous water level measurement is greater than approximately 1.0 foot, recheck the current measurement. The field personnel will indicate the method(s) of water level measurement and any rechecked water levels on the water level measurement form.
- Remove water level measurement equipment and decontaminate according to procedures outlined above.

The following procedures will be used when downloading pressure readings from monitoring wells equipped with pressure transducers:

- Download and save pressure readings from the transducer onto a portable computer.
- Review the recorded readings and check for consistency between readings.
- Synchronize the computer time with the transducer time.
- Check the available storage of the pressure transducer and the battery life. At least 50 percent of storage capacity should be available and 75 percent of the remaining battery life should remain.
- Manually measure the depth to water in the well using procedures described above. Record the manual depth-to-water measurement as described above. If the difference between the transducer reading and the manual reading is greater than 0.05 foot, verify the manual measurement and re-set the reference point to the current verified measured depth to water.

- Upon return to the office, downloaded pressure transducer data must be copied onto a stationary computer. Corrections for potential transducer drift, based on manual water level measurements, are then applied to the data set.

3.4 Equipment Decontamination and Waste Disposal

Water level indicators and previously used pressure transducers and cable will be decontaminated by using a nonphosphate detergent wash, followed by two tap water rinses and a final, distilled water rinse. New pressure transducers and cable will require only a distilled water rinse.

3.5 Documentation

During monitoring events, water level measurements will be recorded on a static water level data sheet (Form B-1). The reported data will include depth to water in feet below the measuring point, a description of the measuring point, the date and time of the measurement, the calculated water level elevation, the method of measurement, and the initials of field personnel. Water level measurements will be reported to the nearest 0.01 foot.

All manually measured depth-to-water levels obtained from wells equipped with pressure transducers will be recorded on the static water level data sheet. The comments section of the static water level data sheet will contain information regarding the downloading of the pressure transducers.

Calibration of the manual water level indicators will be documented on a separate form (Form B-2).

3.6 Quality Assurance

QA of manual water level measurement data will be accomplished by following the procedures described in this FSP. Calibration information will be entered onto the calibration form (Form B-2). In addition, the following QA procedures for water level measurements will be implemented:

- Measure water levels with a calibrated water level indicator. Prior to measuring water levels, verify that the instruments are properly calibrated.

- At each location and/or time interval, measure water levels a minimum of two times during routine water level measurement activities. Measure water levels until two consecutive measurements are obtained that have a difference of less than 0.02 foot. Record the measurement on the static water level data sheet (Form B-1). Measure and record water levels to the nearest 0.01 foot.
- Compare measurement data to previous measurements obtained at the well. For variations from previous measurements greater than 1.0 foot, repeat the measurements. If possible, use an alternative instrument to verify the accuracy of the data. Indicate the method(s) of water level measurement, the water level indicator or steel tape verification, and any rechecked water levels in the comments section on the static water level data sheet (Form B-1).

4. WATER QUALITY PARAMETER MEASUREMENTS

Prior to collecting groundwater samples for laboratory analysis, the water quality parameters electrical conductivity (EC), pH, dissolved oxygen (DO), turbidity, and temperature will be measured in water samples at each of the wells identified in Table B-1 to evaluate general water chemistry of the water sample. Stabilization of the parameters EC, pH, DO, oxidation-reduction potential (ORP), turbidity, and temperature will be indicative of representative water from the aquifer.

4.1 Equipment and/or Instrumentation

Water samples will be directed through a flow-through chamber or, if necessary, placed in a transfer bottle for measurement. Field equipment consists of a conductivity meter to measure EC, a pH meter to measure pH, a field thermometer to measure temperature, a DO meter to measure DO, an ORP tester to measure ORP, and a turbidity meter to measure turbidity. Some of these measurements are available as functions of an integrated instrument or “multi-meter”.

4.2 Preparation

The probes on the conductivity meter, pH meter, DO meter, and ORP tester will be thoroughly rinsed with distilled water prior to each use. The pH meter will be calibrated in pH 4 and pH 10 buffered solutions prior to commencing field work each day. These pH values are expected to bracket the range of pH in groundwater samples collected from monitoring wells at the Site. The conductivity meter will be calibrated prior to commencing field work each day. The conductivity meter will be calibrated using standard calibration solutions selected to bracket the range of conductivity expected in water samples collected at the Site. The manufacturers' instructions for use of the instruments will be followed. The field thermometer will be rinsed with distilled water prior to each use. The accuracy of the field thermometer will be determined by checking the measured reading against other thermometers, if available. A calibration check of the DO meter will be performed by rinsing the probe in distilled water and taking an instrument reading in ambient air; the value should approach 10 milligrams per liter when corrected for temperature and pressure.

4.3 Procedures

A water sample will be directed through a flow-through chamber, placed in a transfer bottle, or parameters will be measured directly at the well discharge point. The parameters EC, pH, temperature, DO, ORP, and turbidity at each sampling location will be measured as follows:

- Calibrate the pH and conductivity meters to standard solutions.
- Rinse the transfer bottle, if used, with sample water prior to filling. Fill the transfer bottle with sample water.
- Immediately submerge the probes and thermometer in the transfer bottle and record measurements after they have stabilized. Continuous readings are possible if a flow-through chamber is used.
- Record all field measurements in the field notebook.
- Compare the present measurements to measurements taken during the previous sampling round, if available. If a discrepancy exists greater than can be expected for routine changes in groundwater quality, repeat the process.
- After parameters are measured, rinse the transfer bottle, thermometer, and probes with distilled water if a transfer bottle is used.
- Discard the water sample in the transfer bottle. This water will not be used to fill sample containers.
- Record parameters at least twice for each casing volume. Indicator parameter stabilization will be defined as three consecutive readings that meet the following stabilization criteria (California Environmental Protection Agency, Department of Toxic Substances Control [DTSC], 2008; EPA, 2002):

Parameter	Stabilization Criteria
Temperature	$\pm 3\%$ of reading (minimum of $\pm 0.2^\circ$ Celsius)
pH	± 0.1
EC	$\pm 3\%$
ORP	± 10 millivolts
DO	± 0.3 milligrams per liter

4.4 Equipment Decontamination and Waste Disposal

The transfer bottle, flow-through cell, and the probes used for measurement of field parameters will be decontaminated before and after each measurement by rinsing with distilled water. Rinsate will be collected and handled with purge water.

4.5 Documentation

Periodic measurements of EC, pH, temperature, DO, ORP, and turbidity for pumped wells will be recorded on the appropriate groundwater sampling information form (Form B-3). Calibration of the EC, DO, and pH meters will be documented on separate forms (Forms B-4 through B-6).

4.6 Quality Assurance

QA of water quality parameter measurements will be accomplished by following the procedures described in this FSP and by following the equipment manufacturers' operating instructions. Temperature, pH, EC, DO, ORP, and turbidity will be measured during each groundwater sampling event. Prior to measuring water quality parameters, field personnel will verify that the instruments are properly calibrated according to procedures specified by the manufacturer. Calibration documentation for each instrument will be maintained for reference purposes (Forms B-4 through B-6). Reference solutions for pH and EC will be prepared and used to properly calibrate the

instrument. The calibration of the DO meter, pH meter, and EC meter will be checked at the start of each day.

5. GROUNDWATER SAMPLE COLLECTION

Representative groundwater samples will be collected for chemical analysis in accordance with the Request for Analyses (Table B-1). Results of water quality analysis will be used to determine the chemical characteristics of the groundwater. Groundwater samples will be analyzed for the chemicals of concern (COCs), specifically volatile organic compounds (VOCs) using EPA Method 8260B; 1,4-dioxane using EPA Method 8270 SIM; and hexavalent chromium using EPA Method 218.6.

Representative groundwater samples for laboratory analysis will be collected from monitoring wells using the low-flow / minimal drawdown method, unless the physical conditions encountered at a well necessitate another method of groundwater sampling. The following major elements of the low-flow method are discussed in more detail in subsequent sections:

- Installation of the pump intake within the screened interval to ensure sampling of formation water within the contaminant zone;
- Purging at a sufficiently low flowrate, generally between approximately 100 to 500 milliliters per minute (ml/min), to minimize turbulence and ensure minimal drawdown, generally less than about 0.33 foot, in the well during purging and sampling with the goal of sustaining a sufficiently low flowrate to avoid causing continuous drawdown in the well;
- Frequent periodic or continuous monitoring of water level drawdown in the well during purging to minimize turbulence and any potential mixing with the overlying stagnant water column; ensure minimal drawdown; and reduce disturbance and stress to the water column in the well and the water-bearing zone being sampled;
- Frequent periodic or continuous monitoring of the field indicator parameters pH, temperature, EC, DO, ORP and turbidity to verify and document stabilization of these indicator parameters prior to collection of groundwater samples; and
- Collection of groundwater samples at a discharge rate that is the same or less than the purge rate.

The low-flow method will be conducted in general accordance with guidelines, methods, and procedures that include those provided by DTSC and EPA (DTSC, 2008; EPA, 2002) (collectively the Guidance).

Other relevant logistical considerations include the manufacturer's specifications and operating instructions for the type of pump; pump and flow controller; water level indicator; and field parameter equipment used for purging and sampling.

The objectives of field measurement data have been specified for accuracy and completeness parameters in Section 4. These objectives will be achieved by conforming to this section and by implementing field measurement QC procedures.

Objectives for laboratory analysis will be achieved in the laboratory by applying control limits for QC samples, including matrix spike samples, matrix spike duplicate samples, laboratory duplicate samples, internal standards, surrogates, and laboratory control standards. Laboratory data quality will be assessed for precision, accuracy, representativeness, completeness, and comparability. Project-specific reporting detection limits will be, to the extent practicable, below the established State or Federal Primary or Secondary Maximum Contaminant Levels / Notification Levels for drinking water where applicable, or at or below State Water Resources Control Board Division of Drinking Water Detection Limits for purposes of reporting (please see detailed list of reporting limits in the Quality Assurance Project Plan [QAPP]). QC limits will be established after a California-certified laboratory has been selected. These limits will be either at or below those QC limits specified in the respective analytical method. Data assessment procedures in the QAPP will be used to determine the achievement of objectives for chemical analyses.

5.1 Equipment and Instrumentation

Sample containers required for collection of water samples for chemical analysis are specified in Table B-1.

A number of potentially suitable equipment and instrumentation options are available for purging and sampling using the low-flow method. Common elements of these options include:

- A water level measuring device capable of measuring water levels to the nearest 0.01 foot and monitoring drawdown periodically or continuously during purging;
- A purging and sampling pump and associated driver/controller mechanism capable of sustaining a pumping rate of about 100 ml/min without aerating the sample;
- Sufficient chemically compatible dedicated sample tubing, optimized to the degree practical to minimize total sample system volume by limiting both the total length and inside diameter of the tubing; and
- A flow-through cell and associated field parameter measurement devices for measurement and frequent periodic or continuous monitoring and recording of the field indicator parameters temperature, pH, EC, turbidity, ORP and DO.

Other basic equipment common to all purging and sampling methods includes necessary health and safety equipment; a stop watch and calibrated volumetric container for measuring and monitoring purge rate; a flow meter; a purge water container for temporary storage/staging of properly labeled and secured purge water; properly preserved sample containers; shipping containers; field data documentation forms, including labels and chain-of-custody (Forms B-1 through B-9); and decontamination supplies.

If the low-flow method cannot be used, a dedicated electric submersible pump or decontaminated Grundfos Redi-Flo2 electric submersible pump with dedicated tubing will be used to purge and sample monitoring wells. Alternatively, if the monitoring well has at least 1 foot of water but less than 3 feet of water above the bottom of the screened interval, a bailer can be used to purge and sample the monitoring well.

5.2 Preparation

Prior to commencing a sampling event, the following information will be determined and reviewed with all field personnel:

- Objective of the monitoring event
- Analytical schedule
- Water quality parameters to be measured

- Required frequency of measurement
- Laboratory selected for sample analysis
- Level of precision required
- Appropriate methodologies to accomplish objective
- QC samples required to accomplish objective

The following procedures will be used during preparation for groundwater sample collection:

- Review project objectives, sampling location, sampling procedures, preservation, special handling requirements, packaging, shipping, analytical parameters and detection limits, and sampling schedule with all personnel.
- Review health and safety procedures with field personnel.
- Follow Site access procedures, if applicable.
- Inform laboratory of expected sample shipment.
- Obtain the appropriate sample bottles from the laboratory.
- Obtain from the laboratory blank reagent-free deionized water for VOC analyses. When using nondedicated equipment in a well to be sampled, one equipment rinsate blank sample will be collected each day, at a minimum, for VOC analysis. The purpose of the equipment rinsate blanks is to identify potential cross contamination associated with inadequate decontamination of nondedicated equipment.
- Obtain from the laboratory trip blank water vials containing reagent-free deionized water for VOC analyses at a rate of two vials for each ice chest containing samples for VOC analysis. Trip blanks will be prepared by the laboratory using reagent-free deionized water. The purpose of the trip blanks is to identify potential contamination associated with container preparation and sample transport.
- Assemble all necessary equipment and supplies that will be required to complete the sampling event. Pumps, drivers, and controllers will be inspected and pre tested, as needed, prior to entering the field to ensure that they are in good repair

and fully functional. Field personnel will compile, review, and document the manufacturer's specifications for all parameter measurement equipment, including device-specific calibration methods, measurement-reading equilibration time, and maintenance requirements, to ensure that the field parameter equipment is fully functional, meets performance specifications, is properly calibrated, and can be properly maintained.

- Determine the minimum volume of water to be removed prior to sampling.

5.3 Procedures

The following procedures will be used for the collection of groundwater samples. If possible, the low-flow / minimal drawdown method will be used during the Work Area activities.

5.3.1 Low-Flow / Minimal Drawdown Method

Because low-flow purge and sample methods draw groundwater from immediately adjacent to the pump intake, this method represents a depth-discrete sample rather than a composite sample of the entire saturated screen interval, which would be obtained by using the multiple casing volume method. Thus the pump set depth is an important consideration when using this method.

5.3.1.1 Pump Installation

Pump installation will either occur prior to the first sampling event if dedicated systems are used, or prior to each sampling event, if non-dedicated systems are used. In either case, the initial pump installation will include testing the pump system to evaluate and record optimal purge rates and driver/controller settings based on each well's performance as determined based on measurements of drawdown and other field parameters, including turbidity, if available.

Prior to setting pumps in each well, all pumps and associated equipment will be thoroughly decontaminated in accordance with specific manufacturer's recommendations.

Pump-set depths will be determined in advance based on well construction specifications and hydrogeologic conditions at each well. The pump intake will generally be set at the middle of the saturated screened interval. Special consideration will be given to water

table wells that exhibit a wide range of seasonal variation, in which case the pump intake may be set at a depth equivalent to the middle of the saturated screened interval during lower water level elevation conditions.

For a given well, the pump intake will be set at the same depth throughout the course of the monitoring program.

Pump systems will be installed with care by slowly and gently lowering the equipment to, but not beyond, the pre-determined pump set depth to minimize turbulence and disruption of the static water column above the pump intake, and to minimize disturbance of bottom sediments and the groundwater in the well adjacent to and below the pump intake.

After each initial pump installation, the pump system will be activated, and drawdown will be measured and recorded as the flowrate is adjusted to optimize non-turbulent flow and achieve minimal drawdown. The well-specific driver/controller settings corresponding to the optimal flowrate for achieving minimal turbulence and drawdown will be recorded for each well for use and further refinement during each subsequent purging and sampling event.

5.3.1.2 Purging

For each well to be sampled, field personnel will calculate and record the depth of the pump intake; the inner diameter and total length of the discharge tubing; and the total system volume for each system installation, which includes the sum of the volume of the pump, the volume of the discharge tubing, and the volume of the flow-through cell used to measure indicator parameters, compensated for the displacement volume of the parameter probes.

System volume will be recorded in the same units that discharge volume will be recorded during purging and sampling, generally milliliters or liters. To the extent practical, thick-walled discharge tubing will be used to minimize tubing/purge volumes. In no case will the purge volume at the time of sampling be less than twice the total system volume.

The overall goal when purging each well is to stabilize the flowrate as soon as possible to achieve the least amount of stress/turbulence and stabilize drawdown for purging and sampling, with a target drawdown on the order of about 0.1 meter (0.33 foot) or less. Purging will commence at the lowest flowrate possible to achieve and sustain continuous

discharge at the surface, while simultaneously monitoring the water level to adjust flowrate downward to minimize drawdown. Measurements of discharge rate will be made using in-line flow meters and/or stop watches and graduated cylinders, beakers, or other calibrated small-volume containers sufficient for quantifying target flowrates that are typically on the order of about 100 ml/min to 500 ml/min. Drawdown will be calculated as the difference between the pumping water level and the pre-pumping static water level.

The actual flowrate and the minimal drawdown goal may be difficult to achieve under some circumstances due to hydraulic properties of the geologic formation within the screened interval. Adjustments may be required based on site and/or well-specific conditions, equipment, and/or personal experience. If the minimal drawdown cannot be maintained, the actual drawdown and flowrate will be monitored and documented on the field data documentation forms.

Indicator Parameter	Stabilization Criteria
Drawdown	Generally <0.1 meter (<0.33 foot)
Flowrate	Generally 100 to 500 ml/min
Temperature	+/- 0.2 degrees Celsius or +/- 3% of reading
pH	+/- 0.1 pH units
EC	+/- 3% of reading (mS/cm)
DO	+/- 0.3 mg/l
Turbidity	1 NTU or +/- 10% when turbidity is >10 NTUs
ORP	+/- 10mV

< = Less than; mS/cm = millisiemens per centimeter; mg/l = milligrams per liter; NTU = nephelometric turbidity unit;
> = Greater than; mV = millivolts

In addition to drawdown and flowrate, indicator parameters will be continuously monitored during purging and sampling. Indicator parameters will be monitored using a flow-through cell of known volume and calibrated meters and probes. Frequency of monitoring for these parameters is a function of the total system volume and purge rate. Indicator parameter monitoring will commence after purging a minimum of one complete total system volume. The minimum time interval between subsequent indicator parameter readings will be equal to or greater than the time required to replace the internal volume of the flow-through cell plus the measurement/reading equilibration time, generally expected to be on the order of every 3 to 5 minutes. Indicator parameter stabilization will

be defined as three consecutive readings after the initial system volume is removed that meet the following stabilization criteria as further detailed in the Guidance (DTSC, 2008; EPA, 2002).

Minimal flowrate, minimal drawdown, and indicator parameter stabilization will be confirmed as soon as possible after commencing purging. Documentation will be maintained in a detailed and well-organized format on the appropriate field data documentation forms (Forms B-1 through B-9).

5.3.2 Multiple Casing Volume Method

The following procedures will be used for the collection of groundwater samples using the multiple casing volume method:

- Measure depth to water in well to be sampled (Section 3).
- Determine the volume of water to be purged from the well. One casing volume is determined by multiplying the volume of water in 1 foot of well casing by the distance between the bottom of the well and the water level measured in the well.
- Purge the well until at least three casing volumes have been removed and the field parameter measurements pH, EC, and temperature have stabilized, provided that the well yields sufficient groundwater to remove three casing volumes within approximately 90 minutes. In the event that a well yield is insufficient, one casing volume will be purged. If one casing volume cannot be purged within 90 minutes, purge the well until the water draws down to the pump intake (typically set at the top of the screen, ensuring that a volume of water equivalent to the volume standing in the blank casing of the well above the screened interval will be purged) and discontinue pumping. The well should be allowed to recover for 2 hours after purging has stopped. Then the well should be sampled as soon after 2 hours as possible. In no event should a well be sampled more than 24 hours following completion of purging. Measure the water quality parameters to determine whether parameters have stabilized (Section 4.3).

- After purging is complete, collect water samples for laboratory analysis. The target flow rate during sample collection should be within 100 to 500 ml/min, consistent with the low-flow sampling approach (Section 5.3.1.2).

5.3.3 Sample Collection and Handling

- Record the following information on the field data sheet (Form B-3):
 - Static depth to groundwater
 - Time that bailing or pumping is started
 - Time of sample collection
 - Pumping rate during sample collection
 - Number of containers collected and analyses to be performed
 - Field parameter measurements for each purge volume
 - Field parameter measurements at time of sampling
 - Physical characteristics of the water including color, odor, turbidity, etc.
 - Total gallons removed at time of sampling
 - Total gallons removed at end of sampling.
- Collect water samples in appropriate sample containers from the pump discharge.
- Attach labels to sample containers immediately after samples are collected.
- General sample collection statements:
 - If sample bottles for analytes specified in this FSP contain preservatives or are sterile, do not rinse bottles; otherwise, triple-rinse unpreserved (not sterile) bottles prior to sample collection.
 - If samples are to be cooled, store on ice in ice chest immediately after collecting.
- Collect headspace-free water samples for VOC analysis in pre-acidified 40-milliliter (ml) glass sample vials preserved with hydrochloric acid. Do not rinse the glass vials with discharge water prior to sample collection. To avoid aeration, hold the glass vial at an angle so the stream of water flows down the

side. To eliminate any air bubbles, fill the vial until it forms a meniscus and replace the Teflon-lined cap. Turn the vial upside down and tap it to check for air bubbles. If there is any headspace in samples collected for VOC analyses, discard the original vial and use a new pre-acidified vial. Repeat this procedure until a sample without headspace is obtained.

- Collect three 40-ml vials for VOC analysis for each well sampled. Place samples in a resealable plastic bag and store on ice in an ice chest immediately after collection.
- Collect water samples for 1,4-dioxane analysis in 250-milliliter amber glass bottles with Teflon-lined caps. Do not rinse the amber glass bottles with sample water prior to sample collection. Store on ice in an ice chest immediately after collection.
- For priority pollutant metals, the samples can be collected filtered in the field or filtered in the laboratory as follows:
 - Field filtered samples: Filter water samples in the field prior to collection in preacidified bottles. An in-line filter (0.45-micron pore size) will be used with the sample collection tubing. A new filter will be used for each location to prevent cross-contamination. Collect water samples for priority pollutant metal analysis in preacidified 1-liter polyethylene bottles preserved with nitric acid. If cations are collected from the same well at the same time, the priority pollutant metals can be obtained by the laboratory from the same bottle. Do not rinse sample bottles with discharge water prior to sample collection. Store on ice in an ice chest immediately after collection.
 - Laboratory filtered samples: Collect water samples for priority pollutant metals (and cations, if applicable) analysis in 1-liter polyethylene bottles. Triple-rinse unpreserved sample bottles with sample water prior to sample collection. Instruct laboratory to filter and acidify immediately upon receipt. Store on ice in an ice chest immediately after collection.
- Collect one field duplicate sample for every 10 samples collected during the sampling event. Analyze duplicate samples for the same compounds as original samples. Send duplicate samples along with the original samples to the primary

laboratory. The location for duplicate sample collection will be determined prior to each sampling round.

- Collect one field blank sample daily or for every 10 samples collected during the sampling event, whichever is more frequent. Analyze field blank samples for VOCs. The field blank will be prepared at a sampling location by the field personnel using reagent-free deionized water obtained from the primary analytical laboratory.
- If nondedicated sampling equipment is used, collect one rinsate blank sample daily or for every 10 samples collected during the sampling event, whichever is more frequent. Analyze field blank samples for VOCs. The field blank will be prepared at a sampling location by the field personnel using reagent-free deionized water obtained from the primary analytical laboratory.
- Include one trip blank sample containing reagent-free deionized water for VOC analysis to accompany each ice chest shipped each day for these analyses. The trip blanks will be prepared by the primary analytical laboratory, using reagent-free deionized water.
- Prepare split samples for EPA or other agencies during groundwater sampling, if required, by alternately filling agency and project sample containers in sequential order for each parameter until all containers are filled.
- Handle duplicate, trip blank, and field blank water samples in a manner identical to other water samples.
- Record all pertinent data concerning each sample on the groundwater sampling information field data form (Form B-3).
- Record all pertinent data concerning each duplicate, split, and blank sample on the appropriate field data log forms (Forms B-7 and B-8).
- Complete chain-of-custody record at each sample location prior to sampling at the next sample location (Form B-9).
- Prepare chain-of-custody record at the completion of each sampling event.
- Package, store, and transport the samples to the laboratory at the conclusion of each sampling day. Samples will be delivered to the laboratories as quickly as possible, via laboratory courier, if available.

5.4 Sample Containers, Preservation, and Transmittal

A list of the types and volumes of sample containers used for groundwater sampling is in Table B-1. The laboratory will prepare the 40-ml glass vials and septa used to collect samples for VOC analysis. The vials will be washed with detergent, rinsed with reagent-free deionized water, and dried 1 hour at 105 degrees Celsius. Vials to be used for VOC analysis will be preserved with hydrochloric acid. These vials will not be rinsed with sample water prior to collection of samples.

Upon collection, all samples will be sealed with custody seals, labeled, and stored on ice in ice chests until received by the laboratory. Sample shipments will contain completed chain-of-custody records stored in resealable plastic bags for shipment to the laboratory (Form B-9). Each ice chest containing samples will be clearly labeled and sealed to prevent tampering. Standard sample control and chain-of-custody procedures will apply.

5.5 Equipment Decontamination and Waste Disposal

Nondedicated downhole equipment will be decontaminated between monitoring wells to be sampled during the Work Area activities by using a nonphosphate detergent wash, followed by a potable water rinse and a final, distilled water rinse.

Water generated during decontamination procedures will be containerized and stored on-Site. Spent health and safety equipment will be containerized and stored on-Site.

Purge water from monitoring wells will be contained at the wellhead and transported to an on-Site storage tank or other designated purge water storage container. Disposal of purge water practices will be consistent with the Section 6 for handling, storage, characterization, and disposal of investigation-derived waste (IDW).

5.6 Documentation

A record of sample identification numbers will be maintained on standardized field data forms (Forms B-7 through B-9). Additional field data include a record of significant events, observations, measurements, personnel, site conditions, sampling procedures, measurement procedures, and calibration records.

All field data entries in the field log will be signed, dated, and kept as a permanent record. Erroneous entries will be corrected by crossing a line through the error and entering the correct information. Corrections will be initialed by the person making the re-entry.

Sample identification documents will be prepared so that sample identification and chain-of-custody are maintained and sample disposition is controlled. Standard sample identification labels and chain-of-custody records will be used to record all information. Sample documentation forms and labels will be completed with waterproof ink. The sample documentation forms will accompany the samples to the laboratory. Copies of the sample documentation forms will be retained by the samplers and sent directly to the QA Manager designated for the project.

Preprinted adhesive sample labels will be secured to the sample containers by field personnel. The following information will be recorded on the sample label:

- Sample location/identifier
- Depth at which sample was collected, if applicable
- Date and time sample was collected
- Analyses to be performed
- Preservation instructions
- Project number
- Sampler's initials
- Any other pertinent information
- Any special instructions to laboratory personnel

Official custody of samples will be maintained and documented from the time of sample collection until the validation of analytical results. The chain-of-custody record is the document that records the transfer of sample custody. The chain-of-custody record also serves to cross reference the sample identifier assigned by the QA Manager with the sample identifier assigned by the laboratory. The chain-of-custody record includes the following information:

- Sample location/identifier

- Project number
- Sampling date
- Sampling personnel
- Shipping method
- Sample description
- Sample volume
- Number of containers
- Sample destination
- Preservatives used
- Analyses to be performed
- Special handling and reporting procedures
- The identity of personnel relinquishing and accepting custody of the samples

The sampling personnel will be responsible for the samples and will sign the chain-of-custody record to document sample transferal or transport. Samples will be packaged in sealed containers for transport and dispatched to the appropriate laboratory for analysis with a separate chain-of-custody record accompanying each shipment. The method of transport, courier name(s), and other pertinent information will be entered on the chain-of-custody record. During transport, samples will be accompanied by the chain-of-custody record.

Once received at the laboratory, laboratory custody procedures apply. It is the laboratory's responsibility to acknowledge receipt of samples and verify that the containers have not been opened or damaged. It is also the laboratory's responsibility to maintain custody and sample tracking records throughout sample preparation and analysis.

5.7 Quality Assurance

QA for groundwater samples collected during routine groundwater monitoring will be accomplished by following the procedures described in this FSP and by monitoring laboratory QA procedures. Laboratory QA procedures are specified in the laboratory's QA Manual, and evaluation of laboratory QA documentation is described in the QAPP. In addition, the following field QC methods will be implemented during sample collection:

- Collect one field duplicate sample for every 10 samples collected during the sampling event. Send duplicate samples along with original samples to the primary laboratory. The purpose of the duplicate sample is to determine the precision of field sampling and laboratory analysis techniques. Field duplicate samples will be laboratory blind duplicates. A false well identifier will be assigned for the sample identifier and recorded on the sample label and chain-of-custody record along with a false sample collection time. The actual sample location, sample time, and corresponding false sample identifier and sample time will be recorded on the duplicate sample log form (Form B-8).
- Collect one equipment rinsate blank sample each day or for every 10 samples collected, whichever is more frequent, if nondedicated sampling equipment is used in one or more wells. Equipment rinsate samples will be analyzed for VOCs. If laboratory analysis of the equipment rinsate sample indicates inadequate decontamination procedures, corrective action will be taken as detailed in the QAPP. Record blank sample preparation on the appropriate field form (Form B-7).
- Collect one field blank sample each day during the sampling event or for every 10 samples collected, whichever is more frequent. Sampling personnel will prepare the field blanks at a predetermined sample location using organic-free water obtained from the analytical laboratory. The purpose of the field blank is to identify possible contamination associated with sample collection and transport. Record blank sample preparation on the appropriate field form (Form B-7).
- Include one trip blank sample containing reagent-free deionized water for VOC analyses to accompany each ice chest shipped each day for these analyses. The trip blanks will be prepared by the analytical laboratory using reagent-free

deionized water. The purpose of the trip blank is to identify possible contamination associated with container preparation and sample transport.

- Prepare split samples for EPA or other agencies during groundwater sampling, if required, by alternately filling agency and primary sample containers in sequential order for each parameter until all containers are filled.
- Identify duplicates and blank samples in the same manner as all other samples. Identifiers will be determined prior to the sampling round and will be indicated in the sampling memorandum issued to field sampling personnel prior to the start of sampling activities.
- Prior to the start of each sampling round, the Project Manager will determine the sampling locations for field blank preparation and duplicate sample collection. Additionally, the field personnel will specify labeling procedures for these samples. This information will be contained in a sampling memorandum issued to field sampling personnel prior to the start of sampling activities.

6. HANDLING, STORAGE, CHARACTERIZATION, AND DISPOSAL OF INVESTIGATION-DERIVED WASTES

Wastes generated during this investigation will include water and disposable personal protective equipment/sampling equipment.

A central staging area for temporary storage of IDW and/or decontamination of sampling equipment will be established within the Work Area. The central staging area will have sufficient area for managing IDW in 55-gallon drums, roll-off bins and/or temporary aboveground storage tanks (collectively referred to as IDW containers). The field personnel will work with the Project Coordinator to develop and document the unique IDW container Identification Numbers (included with each IDW container), dates of IDW placement into the container, the location of the container, and the date when the container was sampled for waste characterization.

A sticker/label that reads ‘This Container On Hold Pending Analysis’ will be affixed to the outside of each IDW container once IDW is first placed in them. The sticker/label will detail the appropriate contact information. If the waste is found to be hazardous, the label will be changed to read “Hazardous Waste”.

Analytical results of groundwater sampling will be used to characterize water generated during field activities. Additional analyses of temporarily stored IDW may be required to complete waste characterization, depending on disposal requirements.

Representative samples for waste profiling will be collected from consolidated IDW containers and submitted to a California-certified laboratory for analysis in accordance with California Code of Regulations, Title 22, Section 66261.24. Following waste profiling, the IDW will be transported by a licensed waste hauler for disposal at an appropriately permitted solid or hazardous waste facility in accordance with Federal and State requirements, including valid EPA CERCLA Off-Site Rule approval (40 CFR 300.440). IDW will be stored for no more than 60 days during characterization and consolidation.

7. REFERENCES

California Environmental Protection Agency, Department of Toxic Substances Control (DTSC), 2008. Representative Sampling of Groundwater for Hazardous Substances – Guidance Manual for Groundwater Investigations. July 1995, Revised February 2008.

U.S. Environmental Protection Agency (EPA), 2002. Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers, OSWER, EPA-S-02-001. Ground Water Forum Issue Paper. May 2002.

EPA, 2016. Consent Decree regarding Operable Unit 2 at the Omega Chemical Corporation Superfund Site, Case 2:16-cv-02696 Document 4-1. Filed with United States District Court, Central District of California, Western Division. April 20, 2016.

TABLE

Table B-1
Request for Analyses for Groundwater Samples*
Omega Superfund Site
Operable Unit 2

Geosyntec Consultants

ANALYSES REQUESTED		Volatile Organic Compounds	1,4-Dioxane	Chromium VI
METHOD		EPA 8260B	EPA 8270C SIM	EPA 218.6
LABORATORY		Eurofins Calscience, Inc.		
CONTAINER TYPE		40ml VOA Vial	1L Amber	250ml Poly
PRESERVATIVES		4° C, HCl, pH <2	4° C	4° C
ANALYTICAL HOLDING TIMES		14 days	7days/40 days	24 hrs ^a
NO. CONTAINERS PER ANALYSIS		3	1	1
SAMPLE LOCATION	SAMPLING SCHEDULE			
Sampling Points				
Wells installed as part of the OU2 work				
MW1A	Annually	1	1	1
MW1B	Annually	1	1	1
MW2	Annually	1	1	1
MW3	Annually	1	1	1
MW4A	Annually	1	1	1
MW4B	Annually	1	1	1
MW4C	Annually	1	1	1
MW5	Annually	1	1	1
MW6	Annually	1	1	1
MW7	Annually	1	1	1
MW8A	Annually	1	1	1
MW8B	Annually	1	1	1
MW8C	Annually	1	1	1
MW8D	Annually	1	1	1
MW9A	Annually	1	1	1
MW9B	Annually	1	1	1
MW10	Annually	1	1	1
MW11	Annually	1	1	1
MW12	Annually	1	1	1
MW13A	Annually	1	1	1
MW13B	Annually	1	1	1
MW14	Annually	1	1	1
MW15	Annually	1	1	1
MW16A	Annually	1	1	1
MW16B	Annually	1	1	1
MW16C	Annually	1	1	1
MW17A	Annually	1	1	1
MW17B	Annually	1	1	1
MW17C	Annually	1	1	1
MW18A	Annually	1	1	1
MW18B	Annually	1	1	1
MW18C	Annually	1	1	1

Table B-1
Request for Analyses for Groundwater Samples*
 Omega Superfund Site
 Operable Unit 2

Geosyntec Consultants

ANALYSES REQUESTED		Volatile Organic Compounds	1,4-Dioxane	Chromium VI
METHOD		EPA 8260B	EPA 8270C SIM	EPA 218.6
LABORATORY		Eurofins Calscience, Inc.		
CONTAINER TYPE		40ml VOA Vial	1L Amber	250ml Poly
PRESERVATIVES		4° C, HCl, pH <2	4° C	4° C
ANALYTICAL HOLDING TIMES		14 days	7days/40 days	24 hrs ^a
NO. CONTAINERS PER ANALYSIS		3	1	1
SAMPLE LOCATION	SAMPLING SCHEDULE			
MW19	Annually	1	1	1
MW20A	Annually	1	1	1
MW20B	Annually	1	1	1
MW20C	Annually	1	1	1
MW21	Annually	1	1	1
MW22	Annually	1	1	1
MW23A	Annually	1	1	1
MW23B	Annually	1	1	1
MW23C	Annually	1	1	1
MW23D	Annually	1	1	1
MW24A	Annually	1	1	1
MW24B	Annually	1	1	1
MW24C	Annually	1	1	1
MW24D	Annually	1	1	1
MW25A	Annually	1	1	1
MW25B	Annually	1	1	1
MW25C	Annually	1	1	1
MW25D	Annually	1	1	1
MW26A	Annually	1	1	1
MW26B	Annually	1	1	1
MW26C	Annually	1	1	1
MW26D	Annually	1	1	1
MW27A	Annually	1	1	1
MW27B	Annually	1	1	1
MW27C	Annually	1	1	1
MW27D	Annually	1	1	1
MW28	Annually	1	1	1
MW29	Annually	1	1	1
MW30	Annually	1	1	1
MW31	Annually	1	1	1
MW32 ^b	Annually	1	1	1

Table B-1
Request for Analyses for Groundwater Samples*
Omega Superfund Site
Operable Unit 2

Geosyntec Consultants

ANALYSES REQUESTED		Volatile Organic Compounds	1,4-Dioxane	Chromium VI
METHOD		EPA 8260B	EPA 8270C SIM	EPA 218.6
LABORATORY		Eurofins Calscience, Inc.		
CONTAINER TYPE		40ml VOA Vial	1L Amber	250ml Poly
PRESERVATIVES		4° C, HCl, pH <2	4° C	4° C
ANALYTICAL HOLDING TIMES		14 days	7days/40 days	24 hrs ^a
NO. CONTAINERS PER ANALYSIS		3	1	1
SAMPLE LOCATION	SAMPLING SCHEDULE			
Wells installed by the WRD				
Hawkins 1a1	Annually	1	1	1
Hawkins 1b2	Annually	1	1	1
Hawkins 1c3	Annually	1	1	1
Hawkins 1c4	Annually	1	1	1
Hawkins 1c5	Annually	1	1	1
Koontz 1a1	Annually	1	1	1
Koontz 1b2	Annually	1	1	1
Koontz 1c3	Annually	1	1	1
Koontz 1c4	Annually	1	1	1
Koontz 1c5	Annually	1	1	1
Wells to be installed as part of the LEI				
LEI Well Cluster Location 1	Annually ^c	TBD	TBD	TBD
LEI Well Cluster Location 2	Annually ^c	TBD	TBD	TBD
LEI Well Cluster Location 3	Annually ^c	TBD	TBD	TBD
Wells to be installed as part of the PDI				
PDI Wells	Annually ^c	TBD	TBD	TBD
TOTAL PRIMARY SAMPLES^d		73	73	73
QA/QC Samples				
Equipment Blanks ^e	Annually	1 per day or 1 per every 10	1 per day or 1 per every 10	1 per day or 1 per every 10
Field Blanks ^f	Annually	--	--	--
Trip Blanks	Annually	1 per cooler	1 per cooler	--
Duplicates ^g	Annually	1 per every 10	1 per every 10	1 per every 10

Notes:

* - This table will be updated following the installation and sampling of the PDI wells and the LEI wells

a - If sample is field filtered and stored in ammonia sulfate buffer preservative, 28-day hold times are permitted.

b - MW32 is constructed with a 1-inch piezometer screened from 80 to 100 feet bgs in the filter pack.

c - PDI and LEI well will be added to WAMP following first year of quarterly monitoring

d - The total primary samples includes all wells with the exception of the new monitoring wells to be installed as part of the PDI and LEI.

e - One equipment rinsate blank will be collected per matrix each day that sampling equipment is decontaminated in the field or for every 10 samples collected, whichever is more frequent.

f - Field blanks will be collected daily when dedicated equipment is used and equipment (rinsate) blanks are not collected.

g - Duplicate samples will be collected at a rate of 10 percent of the samples collected.

°C - degree Celsius

EPA - United States Environmental Protection Agency

feet bgs - feet below ground surface

HCl - hydrochloric acid

L - Liter

LEI - Leading Edge Investigation

ml - milliliter

OU2 - Operable Unit 2

PDI - Pre-Design Investigation

QA/QC - quality assurance/quality control

TBD - To be determined

VOA - volatile organic analysis

WRD - Water Replenishment District

FIGURES

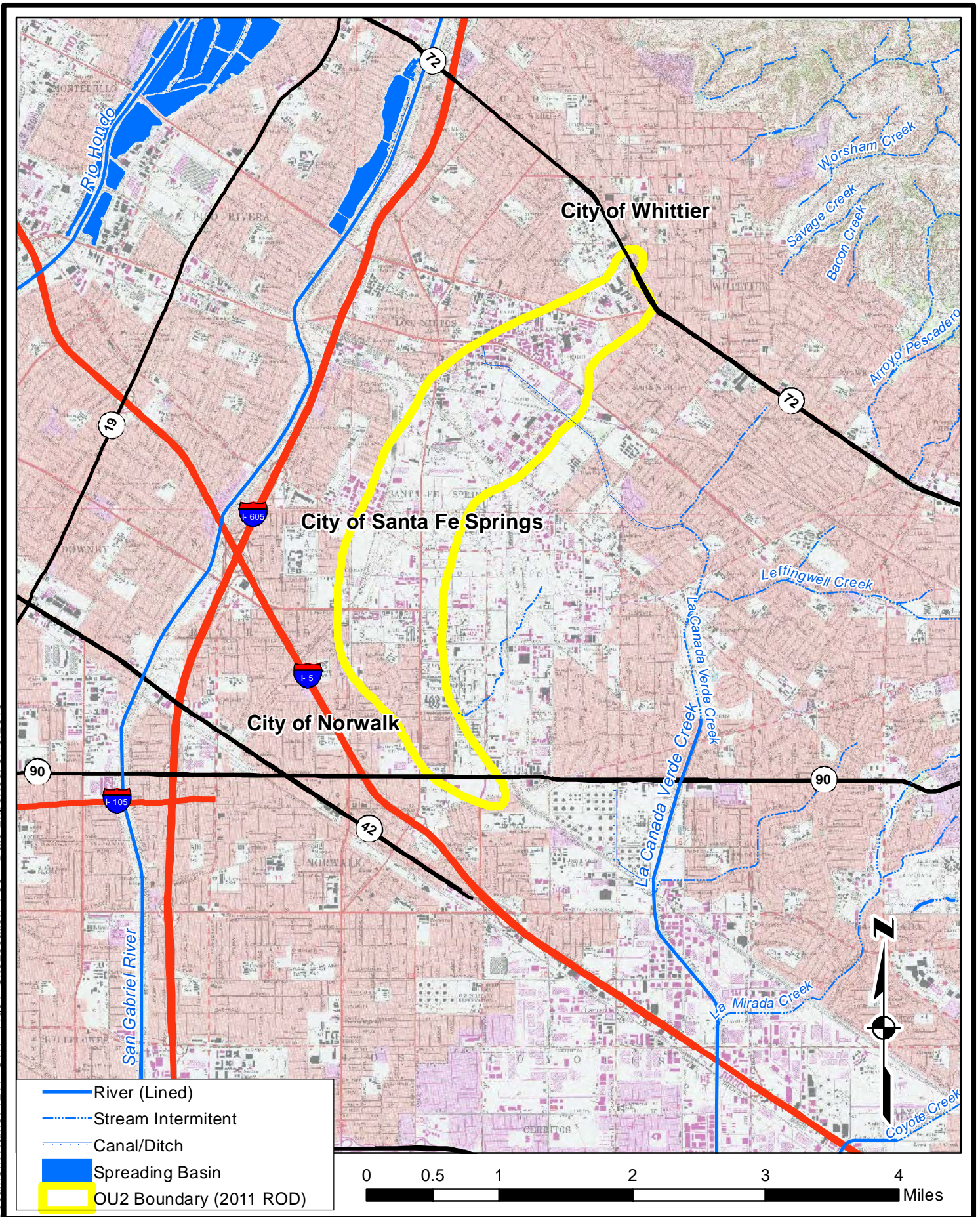
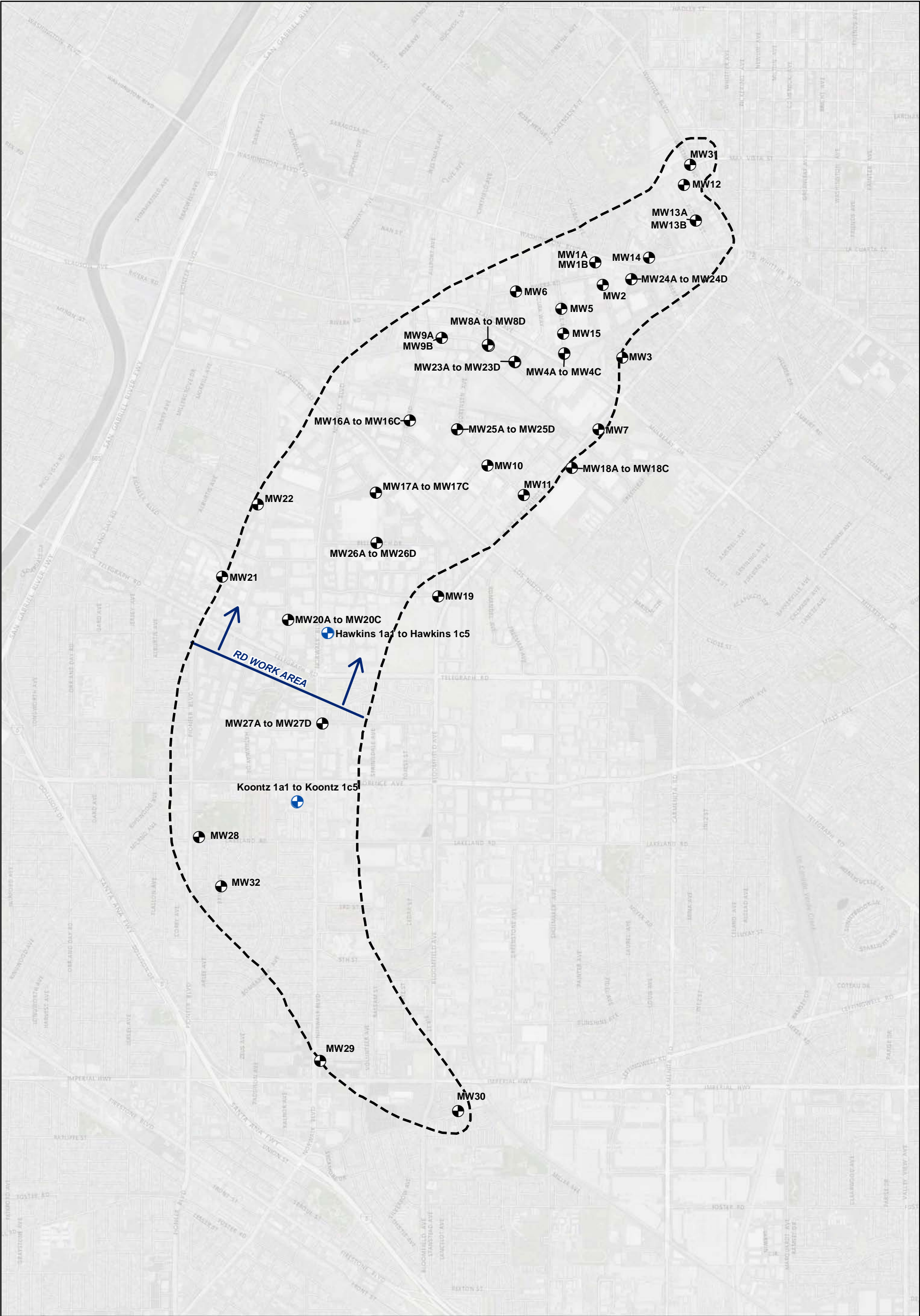


FIGURE B-1. SITE LOCATION



Legend		Work Area Monitoring Network	
Monitoring Wells		Omega Superfund Site - OU2 Los Angeles County, California	
Installed by EPA	OU2 Boundary (2011 ROD)		
Installed by WRD	Remedial Design Work Area (includes Northern Extraction and Central Extraction areas)		
Notes: Wells co-located in groups of three or more have been labelled as a group (eg; MW26A to MW26D). Wells installed during the Leading Edge Investigation and Pre-Design Investigation will be added to the monitoring network upon submittal of their respective reports. WRD = Water Replenishment District OU2 = Operable Unit 2 ROD = Record of Decision			
WR2209		November 2016	

ATTACHMENT B-1

Field Forms

**FORM B-2
WATER LEVEL INDICATOR
CALIBRATION DOCUMENTATION FORM**

PROJECT NUMBER: _____

DATE	TIME	WATER LEVEL INDICATOR TYPE	WATER LEVEL INDICATOR NUMBER	CALIBRATION METHOD	CALIBRATED BY (INITIALS)	REMARKS

**FORM B-3
LOW-FLOW GROUNDWATER SAMPLE FORM**

DATE: _____

TASK: _____

WELL ID: _____

<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th align="center" colspan="2">SELECT TUBING SPECS</th> </tr> <tr> <th style="text-align: left;">TUBING DIAMETER</th> <th style="text-align: left;">TUBING CAPACITY</th> </tr> <tr> <td>3/8" X 1/2"</td> <td>22 mL/ft</td> </tr> <tr> <td>1/4" X 3/8"</td> <td>9.7 mL/ft</td> </tr> <tr> <td>0.17"ID</td> <td>4.5 mL/ft</td> </tr> </table>	SELECT TUBING SPECS		TUBING DIAMETER	TUBING CAPACITY	3/8" X 1/2"	22 mL/ft	1/4" X 3/8"	9.7 mL/ft	0.17"ID	4.5 mL/ft	<p align="center">Calculate System Volume</p> <p>Length of tubing: _____ ft x Capacity of Tubing: _____ mL/ft</p> <p align="right">Tubing Volume = _____ L</p> <p align="right">+ Vol of flow-thru cell: _____ L</p> <p align="right">+ Vol of pump: _____ L</p> <p>Total Vol of System = _____ L x 2 = Min. Purge Volume = _____ L</p>	<p align="center">Initial Measurements</p> <p>Static Depth to water: _____ ft brp</p> <p>Well Total Depth: _____ ft brp</p> <p>Screened Interval : _____ to _____ ft brp</p> <p>Pump Intake : _____ ft brp</p> <p>brp description (circle one): TOC LS other</p>	<p>Purge Summary Initials: _____</p> <p>Begin Purge: _____ End Purge: _____</p> <p>Tot. Vol Purged: _____ L SVs purged: _____</p> <p>Weather Conditions Time: _____</p> <p>Temp. _____ 'F Skies _____</p> <p>Wind _____ mph From _____</p>
SELECT TUBING SPECS													
TUBING DIAMETER	TUBING CAPACITY												
3/8" X 1/2"	22 mL/ft												
1/4" X 3/8"	9.7 mL/ft												
0.17"ID	4.5 mL/ft												

Pump Type (circle one) : Bladder pump or Peristaltic Pump

Time	Flow Controller Settings	Depth to Water (ft brp)	Flow Rate (mL/min)	Volume Purged (L)	System Volumes PurgedFIELD PARAMETERS....						COMMENTS
						Temp. (°____)	Ph units	EC (____S/cm)	O.R.P. (mV)	D.O. (mg/L)	Turbidity (NTU)	
						+/- 3%	+/- 0.1 unit	+/- 3%	+/- 10 mV	+/- 0.3mg/L	+/- 10% (if > 10NTU)	

<p>SAMPLE COLLECTION SAMPLE TIME _____</p> <table style="width:100%;"> <tr> <th style="text-align: left;">ANAYISIS</th> <th style="text-align: left;">QUANTITY</th> <th style="text-align: left;">TYPE</th> </tr> <tr> <td>VOCs by EPA 8260B</td> <td>_____</td> <td>40 mL VOA w/ HCl</td> </tr> <tr> <td>1,4-Dioxane by EPA 8260B MOD</td> <td>_____</td> <td>40 mL VOA w/ HCl</td> </tr> <tr> <td> </td> <td>_____</td> <td> </td> </tr> <tr> <td> </td> <td>_____</td> <td> </td> </tr> </table> <p>DUPLICATES / BLANKS? Y N</p> <p>If yes, complete appropriate forms.</p>	ANAYISIS	QUANTITY	TYPE	VOCs by EPA 8260B	_____	40 mL VOA w/ HCl	1,4-Dioxane by EPA 8260B MOD	_____	40 mL VOA w/ HCl		_____			_____		<p>AIR MONITORING PID/FID ppm: VAULT _____ BKGD _____ BREATHING ZONE _____ DISCHARGE WATER _____</p> <p>NOTES (Color, odor, sand and silt content, factors possibly affecting samples, condition of vault, wellhead, sampling apparatus, etc.)</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>Acronyms and Abbreciations: SVs = System Volumes; brp = below reference point; mL = milliliters; gal = gallons; L = liters; DTW = depth to water; TD = total depth</p>
ANAYISIS	QUANTITY	TYPE														
VOCs by EPA 8260B	_____	40 mL VOA w/ HCl														
1,4-Dioxane by EPA 8260B MOD	_____	40 mL VOA w/ HCl														

[illegible]

1217_H01_2016_1_PDI_WP_AppB_AttB1_SOPs_Tbl_PDI SOP-10.docx

FORM B-6
INSTRUMENT CALIBRATION LOG FOR GROUNDWATER SAMPLING: DISSOLVED OXYGEN METER CALIBRATION
(AIR METHOD)

[illegible]

(a) Calibration value determined by multiplying solubility value by altitude correction factor

°C = Degrees Celsius
ft msl = Feet mean sea level
mg/l = Milligrams per liter

**FORM B-8
DUPLICATE/SPLIT SAMPLE LOG FORM**

SAMPLE DATE	SAMPLE TIME ACTUAL/REPORTED	SAMPLE LOCATION	SAMPLE IDENTIFIER	ANLAYTICAL METHOD	COMMENTS	INITIALS

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST FORM

DATE _____ PAGE _____ OF _____

[illegible]

ORIGINAL: LABORATORY YELLOW: QA MANAGER PINK: FIELD/TASK MANAGER